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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/620,937	07/16/2003	Ramin Samadani	100110275-1	8859
22879 7590 06/02/2008 HEWLETT PACKARD COMPANY P O BOX 272400, 3404 E. HARMONY ROAD INTELLECTUAL PROPERTY ADMINISTRATION FORT COLLINS, CO 80527-2400				
			EXAMINER PERUNGAVOOR, SATHYANARAYA V	
			ART UNIT 2624	PAPER NUMBER
			NOTIFICATION DATE 06/02/2008	DELIVERY MODE ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary

Application No.

10/620,937

Applicant(s)

SAMADANI, RAMIN

Examiner

SATH V. PERUNGAVOOR

Art Unit

2624

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 February 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6, 10-15 and 19-22 is/are rejected.
- 7) ☒ Claim(s) 7-9 and 16-18 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SI/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

[1] In view of the appeal brief filed on February 6, 2008, PROSECUTION IS HEREBY REOPENED. A new ground of rejection is set forth below.

[2] To avoid abandonment of the application, appellant must exercise one of the following two options:

(1) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply under 37 CFR 1.113 (if this Office action is final); or,

(2) initiate a new appeal by filing a notice of appeal under 37 CFR 41.31 followed by an appeal brief under 37 CFR 41.37. The previously paid notice of appeal fee and appeal brief fee can be applied to the new appeal. If, however, the appeal fees set forth in 37 CFR 41.20 have been increased since they were previously paid, then appellant must pay the difference between the increased fees and the amount previously paid.

[3] A Supervisory Patent Examiner (SPE) has approved of reopening prosecution by signing below:

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

[4] Claims 2 and 11 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in

the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

- Applicant provided mappings for claims 2 and 11 in page 9 of the appeal brief, in view of these mappings there is no support for the claimed subject matter in the specification or the originally filed claims. For example in claim 2, the emphasized portion is not supported in the specification, “The high resolution image reconstruction system of claim 1, further comprising a **controller that control relative contributions** of said **motion-compensated high spatial frequency component** estimate of said low resolution image frame **and** said **generated low spatial frequency component** of said low resolution image frame in the reconstructed high resolution image of said low resolution image frame based on measures of confidence in motion estimates used to map said high spatial frequency component to the motion-compensated high spatial frequency component estimate of said low resolution image frame”.

[5] Claims 2 and 11 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

- Applicant provided mappings for claims 2 and 11 in page 9 of the appeal brief, in view of these mappings there is no support for the claimed subject matter in the specification or the originally filed claims. For example in claim 2, the emphasized portion is not supported in the specification, “The high resolution image reconstruction system of claim 1, further comprising a **controller that control relative contributions** of said **motion-compensated**

high spatial frequency component estimate of said low resolution image frame and said generated low spatial frequency component of said low resolution image frame in the reconstructed high resolution image of said low resolution image frame based on measures of confidence in motion estimates used to map said high spatial frequency component to the motion-compensated high spatial frequency component estimate of said low resolution image frame”.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

[6] Claims 1, 3-5, 10, 12-14, 19 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Parkeⁱ in view of Turnerⁱⁱ et al. (“Turner”).

Regarding claim 1, Parke discloses the following claim limitations:

A system for reconstructing a high resolution image (*i.e. high resolution output*) from at least one image sequence of temporally related high (*i.e. 220*) and low (*i.e. 210*) resolution image frames, each of said high resolution image frames including a low spatial frequency component and a high spatial frequency component [*fig. 2; col. 5, ll. 5-10*], said system comprising: a [first spatial interpolator] adapted to generate a low spatial frequency (*i.e. 211*) component from a low resolution image frame (*i.e. 210*) of

said at least one image sequence [fig. 2; col. 4, ll. 47-61]; a [high spatial frequency component generator] for generating a high spatial frequency (i.e. 221) component from at least one high resolution image frame (i.e. 220) of said at least one image sequence, said at least one high resolution image frame being closely related to said low resolution image frame [fig. 2, col. 5, ll. 1-10]; an [adder] (i.e. 230) for adding said ~~motion-compensated~~ high spatial frequency component estimate (i.e. *temporally interpolated high resolution frames, which have been high pass filtered*) of said low resolution image frame to said generated low spatial frequency component (i.e. *spatially interpolated low resolution images, which have been low pass filtered*) of said low resolution image frame to form a reconstructed high resolution image (i.e. *high resolution output*) of said low resolution image frame [fig. 2; col. 6, ll. 40-55].

Parke does not explicitly disclose the following claim limitations (emphasis added):

a [remapper] for mapping said high spatial frequency component to a **motion-compensated** high spatial frequency component estimate of said low resolution image frame; and

However, in the same field of endeavor Turner discloses the deficient claim limitations, as follows:

A remapper for mapping a high resolution image to generate a motion-compensated (i.e. *move pixels based on motion vector*) high resolution image [col. 4, ll. 60-67; col. 5, ll. 14-23].

It would have been obvious to one with ordinary skill in the art at the time of invention to modify Parke's temporal interpolation to include motion compensation as taught by Turner's

temporal interpolation, the motivation being to generate images of a moving scene [col. 1, ll. 56-60].

Regarding claim 3, Parke and Turner meet the claim limitations, as follows:

The high resolution image reconstruction system of claim 1, wherein said first spatial interpolator upsamples the low resolution image frame in accordance with a bicubic upsampling algorithm *[Bicubic upsampling is notoriously well-known. Official Notice is taken. See Zavaljerskiⁱⁱⁱ et al. at col. 4, ll. 1-5 for evidence.]*.

Regarding claim 4, Parke and Turner meet the claim limitations, as follows:

The high resolution image reconstruction system of claim 1, wherein said first spatial interpolator upsamples the low resolution image frame in accordance with a bilinear upsampling algorithm *[Bilinear upsampling is notoriously well-known. Official Notice is taken. See Zavaljerskiⁱⁱⁱ et al. at col. 4, ll. 1-5 for evidence.]*.

Regarding claim 5, Parke and Turner meet the claim limitations, as follows:

The high resolution image reconstruction system of claim 1, wherein said first spatial interpolator upsamples the low resolution image frame in accordance with a least squares error minimization algorithm *[Least squares error interpolation is notoriously well-known. Official Notice is taken. See Zavaljerskiⁱⁱⁱ et al. at col. 4, ll. 1-5 for evidence.]*.

Regarding claims 10, 12, 13, 14, 19 and 22 all claimed limitations are set forth and rejected as per discussion for claims 1, 3, 4 and 5.

[7] Claims 2, 11, 20 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Parke in view of Turner further in view of Burt^{iv} et al. (“Burt”).

Regarding claim 2, Parke and Turner meet the claim limitations as set forth in claim 1.

Parke and Turner do not explicitly disclose the following claim limitations:

The high resolution image reconstruction system of claim 1, further comprising a [controller] that control relative contributions of said motion-compensated high spatial frequency component estimate of said low resolution image frame and said generated low spatial frequency component of said low resolution image frame in the reconstructed high resolution image of said low resolution image frame based on measures of confidence in motion estimates used to map said high spatial frequency component to the motion-compensated high spatial frequency component estimate of said low resolution image frame.

However, in the same field of endeavor Burt discloses the deficient claim limitations, as follows:

A controller controlling (*i.e. through alignment parameters*) the adding (*i.e. fusion*) of input image and the mosaic to optimize motion confidence [*col. 10, ll. 16-23; col. 11, ll. 45-50*].

It would have been obvious to one with ordinary skill in the art at the time of invention to modify the teachings of Parke and Turner with Burt to apply weighted the alignment parameters according to motion confidence values, the motivation being remove influence of erred motion vectors [*col. 10, ll. 16-23*].

Regarding claims 11, 20 and 21, all claimed limitations are set forth and rejected as per discussion for claim 2.

[8] Claims 6 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Parke in view of Turner further in view of Griessl⁹ et al. (“Griessl”).

Regarding claim 6, Parke and Turner meet the claim limitations as set forth in claim 1.

Parke and Turner do not explicitly disclose the following claim limitations:

The high resolution image reconstruction system of claim 1, wherein said high spatial frequency component generator includes a downsampler for downsampling at least one high resolution image frame of said at least one image sequence.

However, in the same field of endeavor Griessl discloses the deficient claim limitations, as follows:

A downsampler (*i.e. MotionPyramid*) for downsampling at least one high resolution image frame [*col. 6, ll. 1-27*].

It would have been obvious to one with ordinary skill in the art at the time of invention to modify the teachings of Parke and Turner with Griessl to downsample the high resolution image frame, the motivation being to perform hierarchical motion vector calculation [*col. 4, ll. 60-65*].

Regarding claim 15 all claimed limitations are set forth and rejected as per discussion for claim 6.

Allowable Subject Matter

[9] Claims 7-9 and 16-18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Contact Information

[10] Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mr. Sath V. Perungavoor whose telephone number is (571) 272-7455. The examiner can normally be reached on Monday to Friday from 8:30am to 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Matthew C. Bella whose telephone number is (571) 272-7778, can be reached on Monday to Friday from 9:00am to 5:00pm. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Dated: May 29, 2008

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ⁱ US 5,025,394

ⁱⁱ US 6,198,505

ⁱⁱⁱ US 6,101,235

^{iv} US 5,649,032

^v US 6,370,196